



STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

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WASHINGTON STATE CAPTAN USE SUMMARY

- Captan is a non-systemic phthalimide fungicide used to control diseases of many fruit, ornamental and vegetable crops. It improves fruit finish by giving it a healthy, bright colored appearance. It is used in agricultural production as well as by the home gardener.
- Captan is a general use pesticide (GUP) although most uses of the product on food crops were cancelled in the United States in 1989. Captan may be found formulations with a wide range of other pesticides.
- Captan is available in dust, spray powder, liquid and flowable formulations.
- Captan is classified toxicity category IV – practically non-toxic. Products containing captan bear the signal words, “Danger” or “Caution” if packaged in concentrated form because it can be irritating to the skin and eyes. Captan belongs to the phthalamide chemical class.
- Major crop uses in Washington State, listed alphabetically, are as follows:

| CROP | WASS* 2001 EST. ACRES PLANTED | EST. % ACRES TREATED | EST. LBS. A.I./ACRE | # OF APPS | EST. ACRES TREATED | EST. LBS. A.I. APPLIED |
|-------------------------|--|----------------------------|------------------------|--------------|-----------------------|------------------------------|
| Apples | 168,000 | 5 | 4 | 2 | 8,400 | 16,800 |
| Blueberries | 2,000 | 50 | 1.5 | 4 | 1,000 | 6,000 |
| Cherries** | 22,000 | | | | | |
| Peaches & Nectarines | 2,700 | 10 | 4 | 1 | 420 | 1,680 |
| Plums/Prunes | 1,000 | | | | | |
| Raspberries & canefruit | 9,500 | 100 | ** | ** | 9,500 | 87,800 |
| Strawberries | 1,600 | | | | | |

* Washington Agricultural Statistics Service

** See narrative for breakdown of usage between northwestern and southwestern Washington State.

MAJOR USES (listed alphabetically):

The major use listing supplies the most commonly used formulations of the active ingredient. No discrimination or endorsement is intended.

The pesticide labels take precedence over any information contained herein. It is the responsibility of the user to comply with the label directions provided.

The following pesticide use summary reflects the general pesticide practices for the listed commodities. The use information is not intended to reflect the pesticide application practices of any individual.

APPLES:

- Apples are grown primarily in Yakima (75,264 acres), Grant (33,615 acres), Okanogan (24,164 acres), Benton (18,425 acres), Chelan (17,096 acres), Douglas (14,383 acres), Franklin and Walla Walla counties.
- Fungicides are rotated for resistance management, alternating or tank-mixing fungicides that have a different mode of action. Growers may use 5-6 sprays per growing season to control infections, and thus need a considerable variety of fungicides in order to both obtain good results and practice resistance management.
- Rally, Elite, or Procure are the most commonly used fungicides. These applications are not frequent in dry areas.
- Captan is used as an emergency disease management product. If it is a dry season, the use may be zero.
- If there is a very wet spring or overhead sprinklers are used, captan (Captan 50WP) is used to control apple scab and mildew.
- If used, Captan (Captan 50WP) is most commonly applied at a rate of 6 pounds a.i. per acre during the 2 –3 weeks after bloom (early June).

BLUEBERRIES:

- Blueberries are grown primarily in Skagit (550 acres), Whatcom (450 acres), Lewis (170 acres), Clark (130 acres) and Thurston counties.
- Fungicides are rotated for resistance management but with this chemical the use patterns vary with production area as follows:

Southwestern WA (Lewis & Cowlitz counties)

- The only current use for captan (Captan 50WP) is control of gray mold (*Botrytis cinerea*).
 - Ground applied at 10 – 14 day intervals during bloom (late April/late May)
 - Typically rate 4 – 5 pounds (2 – 2.4 pounds a.i.) per acre.
 - 2 applications per season
- Captan (Captan 50WP) may be ground applied to control mummy berry. However, captan is not as effective against mummyberry as propiconazole (Orbit – WA Section 18 # 03-WA-10), which is the preferred fungicide.
- Captan (Captan 50WP) is no longer used to control Alternaria fruit rot and Anthracnose. The fungi are more effectively controlled with azoxystrobin.

Northwestern WA (Skagit & Whatcom counties)

- The only current use for captan (Captan 50WP) is control of gray mold (*Botrytis cinerea*).
 - Ground applied at 10 – 14 day intervals during bloom (late April/late May)
 - Typically rate 2 – 4 pounds (1 – 2 pounds a.i.) per acre.
 - 3 – 5 applications per season
 - Growers may substitute Captan 4F at a rate of 1 –2 quarts per acre for the last one or two sprays reduce visible spray residue on the fruit.
- Captan (Captan 50WP) may be ground applied to control mummy berry. However, captan is not as effective against mummyberry as propiconazole (Orbit – WA Section 18 # 03-WA-10), which is the preferred fungicide.
- Captan (Captan 50WP) is no longer used to control Alternaria fruit rot and Anthracnose. The fungi are more effectively controlled with azoxystrobin.

CHERRIES:

- Cherries are grown primarily in Yakima (75,264 acres), Grant (33,615 acres), Okanogan (24,164 acres), Benton (18,425 acres), Chelan (17,096 acres), Douglas (14,383 acres), Franklin and Walla Walla counties.

PEACHES & NECTARINES:

- Peaches & nectarines are produced in central Washington State with approximately 2,700 acres of peaches and 1,500 acres of nectarines planted in 2001.
- Fungicides are rotated for resistance management, alternating or tank-mixing fungicides that have a different mode of action. Rally, Elite, or Procure are the most commonly used fungicides. These applications are not frequent in dry areas.
- Captan is used as an emergency disease management product. If it is a dry season, the use may be zero. Captan is not a primary use fungicide.
- If used, captan (Captan 50WP) may be applied at a rate of 4 – 8 pounds (2 – 4 pounds a.i.) per acre to control brown rot.
 - Applications occur during blooming period:
 - ✓ Early pink bud (early April)
 - ✓ Full bloom and/or (second week of April)
 - ✓ Petal fall (mid-April)
- Captan (Captan 50WP) may also be applied at a rate of 8 pounds (4 pounds a.i.) per acre to control shothole (coryneum blight).
 - Applications occur as follows:
 - ✓ First – 50% leaf fall in late autumn (November)
 - ✓ Second – during the dormant season (January – March)
 - ✓ Third – shuck fall (late April)

PLUMS & PRUNES:

- Prunes & plums are produced in central Washington State with an estimated 1,000 acres planted in 2001.
- Captan is used as an emergency disease management product. If it is a dry season, the use may be zero. Captan is not a primary use fungicide.

- If used, captan (Captan 50WP) may be applied at a rate of 4 – 6 pounds (2 – 3 pounds a.i.) per acre to control brown rot.
 - Applications occur during blooming period:
 - ✓ Early pink bud (early April)
 - ✓ Full bloom and/or (second week of April)
 - ✓ Petal fall (mid-April)
- Captan (Captan 50WP) may also be applied at a rate of 4 – 6 pounds (2 – 3 pounds a.i.) per acre during full bloom to control russeting (russet scab).

RASPBERRIES AND CANEFruit:

- Seventy-seven percent (77%) of all raspberries grown in Washington State are grown in Whatcom County (6,400 acres). The remaining raspberry acreage is found in Skagit (1,330 acres), Clark (860 acres), Cowlitz (600 acres) and Pierce (110 acres) counties.

Southwestern WA (Cowlitz counties)

- Captan (Captan 50WP) may be applied with another fungicide with a different mode of activity to control fruit rot (*Botrytis cinerea*).
 - Applications of Captan 50WP at a rate of 4 pounds (2 pounds a.i.) per acre begin at 5% first bloom (May) and then follow a 7 – 10-day interval, rotating captan to cyprodinil + fludioxonil (Switch 62.5WG), then back to captan.
 - Typically 3 applications are made.
 - Average total usage is 12 pounds (6 pounds a.i.) per year.
 - If growing conditions are wet, the Switch 62.5WG application will be held off and captan is applied as the last application of fungicide.
- Captan may be rotated with fenhexamid (Elevate 50WDG) in place of cyprodinil + fludioxonil (Switch 62.5WG), making the rotation Captan 50WP/Elevate 50WDG. See rotation above.

Northwestern WA (Skagit & Whatcom counties)

- Captan (Captan 50WP) is applied with another fungicide with a different mode of activity to control fruit rot (*Botrytis cinerea*).
 - Applications of Captan 50WP at a rate of 4 pounds (2 pounds a.i.) per acre begin at 5% first bloom (May) and then follow a 7 – 10-day interval, rotating captan to cyprodinil + fludioxonil (Switch 62.5WG), then back to captan.
 - Typically 5 – 6 applications are made.
 - Average total usage is 20 pounds (10 pounds a.i.) per year.
 - If growing conditions are wet, the Switch 62.5WG application will be held off and captan is applied as the last application of fungicide.

STRAWBERRIES:

- Strawberries are grown in western Washington in Whatcom (390 acres), Skagit (360 acres), Clark (190 acres), Pierce (160 acres) and Thurston counties.
- Captan (Captan 50WP) is control of gray mold (*Botrytis cinerea*).
 - Ground applied at 10 – 14 day intervals during bloom (late April/late May) at a rate of 3 – 6 pounds (1.5 – 4.3 pounds a.i.) per acre. It is only moderately effective.
- Captan (Captan 50WP) may also be applied at 3 – 6 pounds (1.5 – 4.3 pounds a.i.) per acre to control common leaf spot.

PRODUCT NAMES AND LABELED CROP:

A complete list of all products currently registered for use in Washington State and their respective labeled uses is attached.

| PRODUCT NAME | CROP |
|---------------------|-----------------------|
| AGROX PREMIERE | CORN (FIELD) |
| AGROX PREMIERE | CORN (FIELD) |
| AGROX PREMIERE | CORN (SWEET) |
| AGROX PREMIERE | CORN (SWEET) |
| AGROX PREMIERE | POPCORN |
| AGROX PREMIERE | POPCORN |
| CAPTAN 400 | ALFALFA |
| CAPTAN 400 | BARLEY |
| CAPTAN 400 | BEAN (DRY) |
| CAPTAN 400 | BEAN (GREEN) |
| CAPTAN 400 | BEET |
| CAPTAN 400 | BIRDSFOOT TREFOIL |
| CAPTAN 400 | BROCCOLI |
| CAPTAN 400 | BRUSSELS SPROUT |
| CAPTAN 400 | CABBAGE |
| CAPTAN 400 | CANTALOUPE |
| CAPTAN 400 | CAULIFLOWER |
| CAPTAN 400 | CLOVER |
| CAPTAN 400 | CORN (FIELD) |
| CAPTAN 400 | CORN (SWEET) |
| CAPTAN 400 | COWPEA |
| CAPTAN 400 | CUCUMBER |
| CAPTAN 400 | FLAX |
| CAPTAN 400 | GRASS |
| CAPTAN 400 | LENTIL |
| CAPTAN 400 | LESPEDEZA |
| CAPTAN 400 | MUSKMELON |
| CAPTAN 400 | MUSTARD |
| CAPTAN 400 | OAT |
| CAPTAN 400 | PEA (DRY) |
| CAPTAN 400 | PEA (GREEN) |
| CAPTAN 400 | PEPPER |
| CAPTAN 400 | PUMPKIN |
| CAPTAN 400 | RADISH |
| CAPTAN 400 | RAPE GREENS |
| CAPTAN 400 | RYE |
| CAPTAN 400 | SORGHUM |
| CAPTAN 400 | SOYBEAN |
| CAPTAN 400 | SPINACH |
| CAPTAN 400 | SQUASH (SUMMER TYPES) |

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|-------------------------------|-----------------------|
| CAPTAN 400 | SQUASH (WINTER TYPES) |
| CAPTAN 400 | SUGARBEET |
| CAPTAN 400 | SUNFLOWER |
| CAPTAN 400 | SWISS CHARD |
| CAPTAN 400 | TURNIP |
| CAPTAN 400 | WATERMELON |
| CAPTAN 400 | WHEAT |
| CAPTAN 5% POTATO SEED TREATER | POTATO |
| CAPTAN 50 WETTABLE POWDER | APPLE |
| CAPTAN 50 WETTABLE POWDER | APPLE (POST HARVEST) |
| CAPTAN 50 WETTABLE POWDER | APRICOT |
| CAPTAN 50 WETTABLE POWDER | BLUEBERRY |
| CAPTAN 50 WETTABLE POWDER | BULB |
| CAPTAN 50 WETTABLE POWDER | CHERRY |
| CAPTAN 50 WETTABLE POWDER | CHERRY (POST HARVEST) |
| CAPTAN 50 WETTABLE POWDER | FLOWER |
| CAPTAN 50 WETTABLE POWDER | GRAPE |
| CAPTAN 50 WETTABLE POWDER | GRASS |
| CAPTAN 50 WETTABLE POWDER | GREENHOUSE |
| CAPTAN 50 WETTABLE POWDER | LAWN |
| CAPTAN 50 WETTABLE POWDER | NECTARINE |
| CAPTAN 50 WETTABLE POWDER | ORNAMENTAL |
| CAPTAN 50 WETTABLE POWDER | PEACH |
| CAPTAN 50 WETTABLE POWDER | PEAR (POST HARVEST) |
| CAPTAN 50 WETTABLE POWDER | PLUM |
| CAPTAN 50 WETTABLE POWDER | PRUNE |
| CAPTAN 50 WETTABLE POWDER | ROSE |
| CAPTAN 50 WETTABLE POWDER | SHRUB |
| CAPTAN 50 WETTABLE POWDER | STRAWBERRY |
| CAPTAN 50WP | APPLE |
| CAPTAN 50WP | APPLE (POST HARVEST) |
| CAPTAN 50WP | APRICOT |
| CAPTAN 50WP | BLUEBERRY |
| CAPTAN 50WP | BULB |
| CAPTAN 50WP | CHERRY |
| CAPTAN 50WP | CHERRY (POST HARVEST) |
| CAPTAN 50WP | DECIDUOUS/SHADE TREE |
| CAPTAN 50WP | FLOWER |
| CAPTAN 50WP | FLOWER (GREENHOUSE) |
| CAPTAN 50WP | GRAPE |
| CAPTAN 50WP | GRASS |
| CAPTAN 50WP | GREENHOUSE |
| CAPTAN 50WP | LAWN |
| CAPTAN 50WP | NECTARINE |
| CAPTAN 50WP | ORNAMENTAL |

| | |
|---------------------------|-------------------------|
| CAPTAN 50WP | ORNAMENTAL TREE |
| CAPTAN 50WP | PEACH |
| CAPTAN 50WP | PEAR (POST HARVEST) |
| CAPTAN 50WP | PLUM |
| CAPTAN 50WP | PRUNE |
| CAPTAN 50WP | ROSE |
| CAPTAN 50WP | ROSE (GREENHOUSE) |
| CAPTAN 50WP | SHRUB |
| CAPTAN 50WP | SHRUB (GREENHOUSE) |
| CAPTAN 50WP | STRAWBERRY |
| CAPTAN 50WP | TURF |
| CAPTAN 50WP (RASP/BLAC) | BLACKBERRY |
| CAPTAN 50WP (RASP/BLAC) | RASPBERRY |
| CAPTAN 7.5 DUST FUNGICIDE | POTATO |
| CAPTAN 80-WP | APPLE |
| CAPTAN 80-WP | APPLE (POST HARVEST) |
| CAPTAN 80-WP | APRICOT |
| CAPTAN 80-WP | BLUEBERRY |
| CAPTAN 80-WP | BULB |
| CAPTAN 80-WP | CHERRY |
| CAPTAN 80-WP | CHERRY (POST HARVEST) |
| CAPTAN 80-WP | DECIDUOUS/SHADE TREE |
| CAPTAN 80-WP | FLOWER |
| CAPTAN 80-WP | FLOWER (GREENHOUSE) |
| CAPTAN 80-WP | GRAPE |
| CAPTAN 80-WP | GRASS |
| CAPTAN 80-WP | GREENHOUSE |
| CAPTAN 80-WP | NECTARINE |
| CAPTAN 80-WP | ORNAMENTAL |
| CAPTAN 80-WP | ORNAMENTAL (GREENHOUSE) |
| CAPTAN 80-WP | ORNAMENTAL TREE |
| CAPTAN 80-WP | PEACH |
| CAPTAN 80-WP | PEAR (POST HARVEST) |
| CAPTAN 80-WP | PLUM |
| CAPTAN 80-WP | PRUNE |
| CAPTAN 80-WP | ROSE |
| CAPTAN 80-WP | ROSE (GREENHOUSE) |
| CAPTAN 80-WP | SHRUB |
| CAPTAN 80-WP | SHRUB (GREENHOUSE) |
| CAPTAN 80-WP | STRAWBERRY |
| CAPTAN 80-WP | TURF |
| CAPTEC 4L | APPLE |
| CAPTEC 4L | APPLE (POST HARVEST) |
| CAPTEC 4L | APRICOT |
| CAPTEC 4L | BLUEBERRY |

| | |
|----------------------------------|----------------------------|
| CAPTEC 4L | BULB |
| CAPTEC 4L | CHERRY |
| CAPTEC 4L | CHERRY (POST HARVEST) |
| CAPTEC 4L | FLOWER |
| CAPTEC 4L | FLOWER (GREENHOUSE) |
| CAPTEC 4L | GRAPE |
| CAPTEC 4L | GRASS SEED CROP |
| CAPTEC 4L | GREENHOUSE |
| CAPTEC 4L | NECTARINE |
| CAPTEC 4L | ORNAMENTAL |
| CAPTEC 4L | PEACH |
| CAPTEC 4L | PEAR (POST HARVEST) |
| CAPTEC 4L | PLUM |
| CAPTEC 4L | PRUNE |
| CAPTEC 4L | ROSE |
| CAPTEC 4L | ROSE (GREENHOUSE) |
| CAPTEC 4L | SHRUB |
| CAPTEC 4L | SHRUB (GREENHOUSE) |
| CAPTEC 4L | STRAWBERRY |
| CAPTEC 4L | TURF |
| CAPTEVATE 68 WDG FUNGICIDE | BLUEBERRY |
| CAPTEVATE 68 WDG FUNGICIDE | STRAWBERRY |
| DREXEL CAPTAN 4L FUNGICIDE | APPLE |
| DREXEL CAPTAN 4L FUNGICIDE | APPLE (POST HARVEST) |
| DREXEL CAPTAN 4L FUNGICIDE | APRICOT |
| DREXEL CAPTAN 4L FUNGICIDE | BLUEBERRY |
| DREXEL CAPTAN 4L FUNGICIDE | BULB |
| DREXEL CAPTAN 4L FUNGICIDE | CHERRY |
| DREXEL CAPTAN 4L FUNGICIDE | CHERRY (POST HARVEST) |
| DREXEL CAPTAN 4L FUNGICIDE | FLOWER |
| DREXEL CAPTAN 4L FUNGICIDE | GRAPE |
| DREXEL CAPTAN 4L FUNGICIDE | GRASS |
| DREXEL CAPTAN 4L FUNGICIDE | GREENHOUSE |
| DREXEL CAPTAN 4L FUNGICIDE | NECTARINE |
| DREXEL CAPTAN 4L FUNGICIDE | ORNAMENTAL |
| DREXEL CAPTAN 4L FUNGICIDE | PEACH |
| DREXEL CAPTAN 4L FUNGICIDE | PLUM |
| DREXEL CAPTAN 4L FUNGICIDE | PRUNE |
| DREXEL CAPTAN 4L FUNGICIDE | ROSE |
| DREXEL CAPTAN 4L FUNGICIDE | SHRUB |
| DREXEL CAPTAN 4L FUNGICIDE | STORED FRUIT AND VEGETABLE |
| DREXEL CAPTAN 4L FUNGICIDE | STRAWBERRY |
| DREXEL CAPTAN 50W (CANE BERRIES) | BLACKBERRY |
| DREXEL CAPTAN 50W (CANE BERRIES) | RASPBERRY |
| DREXEL CAPTAN 50W FUNGICIDE | APPLE |

| | |
|--------------------------------|----------------------------|
| DREXEL CAPTAN 50W FUNGICIDE | APPLE (POST HARVEST) |
| DREXEL CAPTAN 50W FUNGICIDE | APRICOT |
| DREXEL CAPTAN 50W FUNGICIDE | BLUEBERRY |
| DREXEL CAPTAN 50W FUNGICIDE | BULB |
| DREXEL CAPTAN 50W FUNGICIDE | CHERRY |
| DREXEL CAPTAN 50W FUNGICIDE | CHERRY (POST HARVEST) |
| DREXEL CAPTAN 50W FUNGICIDE | FLOWER |
| DREXEL CAPTAN 50W FUNGICIDE | GRAPE |
| DREXEL CAPTAN 50W FUNGICIDE | GRASS |
| DREXEL CAPTAN 50W FUNGICIDE | GREENHOUSE |
| DREXEL CAPTAN 50W FUNGICIDE | NECTARINE |
| DREXEL CAPTAN 50W FUNGICIDE | ORNAMENTAL |
| DREXEL CAPTAN 50W FUNGICIDE | PEACH |
| DREXEL CAPTAN 50W FUNGICIDE | PLUM |
| DREXEL CAPTAN 50W FUNGICIDE | PRUNE |
| DREXEL CAPTAN 50W FUNGICIDE | ROSE |
| DREXEL CAPTAN 50W FUNGICIDE | SHRUB |
| DREXEL CAPTAN 50W FUNGICIDE | STORED FRUIT AND VEGETABLE |
| DREXEL CAPTAN 50W FUNGICIDE | STRAWBERRY |
| ENHANCE VITAVAX-CAPTAN 20-20 | BARLEY |
| ENHANCE VITAVAX-CAPTAN 20-20 | OAT |
| ENHANCE VITAVAX-CAPTAN 20-20 | SOYBEAN |
| ENHANCE VITAVAX-CAPTAN 20-20 | WHEAT |
| FUNGITROL C FUNGICIDE | FORMULATING/MANUFACTURING |
| KERNEL GUARD | CORN (FIELD) |
| KERNEL GUARD | CORN (SWEET) |
| RIVAL FLOWABLE | BEAN (DRY) |
| RIVAL FLOWABLE | SOYBEAN |
| RIVAL FLOWABLE | WHEAT |
| SEEDMATE ISOTOX SEED TREATER F | BEAN (DRY) |
| SEEDMATE ISOTOX SEED TREATER F | BEAN (GREEN) |
| SEEDMATE ISOTOX SEED TREATER F | BEAN (LIMA) |
| SEEDMATE ISOTOX SEED TREATER F | CORN (FIELD) |
| SEEDMATE ISOTOX SEED TREATER F | CORN (SWEET) |
| SEEDMATE ISOTOX SEED TREATER F | PEA (DRY) |
| SEEDMATE ISOTOX SEED TREATER F | PEA (GREEN) |
| SEEDMATE ISOTOX SEED TREATER F | POPCORN |
| SEEDMATE ISOTOX SEED TREATER F | SOYBEAN |
| SEEDMATE ISOTOX SEED TREATER F | SUNFLOWER |

References:

2003 *Farm Chemicals Handbook*, Meister Pro Information Resources

2003 *Pacific Northwest Plant Disease Management Handbook*, Extension Services of OSU, WSU, and UI

2002 *Pest Management Guide for Commercial Small Fruits*, Cooperative Extension, College of Agriculture & Home Economics, Washington State University, EB1491.

2002 *Washington Agricultural Statistics*, Washington Agricultural Statistics Service

2003 Washington State registered pesticide labels

CDMS Label Database: <http://www.cdms.net/manuf/manuf.aspwebsite>

ExToxNet Pesticide Information Profiles: <http://ace.orst.edu/info/extoxnet/pips/pips.html>

Greenbook, Chemical & Pharmaceutical Press Inc.: <http://www.greenbook.net/>

National Agricultural Statistics Service – Agricultural Chemical Use Database: <http://www.pestmanagement.info/nass/>

National Center for Food & Agricultural Policy: <http://www.ncfap.org/database/ingredient/default.asp>

National Pesticide Use Database: <http://www.ncfap.org/database/ingredient/default.asp>

NW Berry and Grape Information Network: <http://berrygrape.orst.edu/>

Pesticide Action Network Pesticide Database: <http://www.pesticideinfo.org/index.html>

U.S. Department of Agriculture National Agricultural Statistics Service: <http://www.usda.gov/nass/>

U.S. Department of Agriculture Pest Management Centers Crop Profiles: <http://www.pmcenters.org/cropprofiles/>

U.S. Department of Agriculture Crop Profiles: <http://pestdata.ncsu.edu/cropprofiles/>

Washington State Pesticide Management Practices: <http://www.tricity.wsu.edu/~cdaniels/wapiap.html>

WSU PICOL Label/Crop Profile Database: <http://picol.cahe.wsu.edu/LabelTolerance.html>

Personal communication and e-mail correspondence – Tom Auvil, October 17, 2003, Washington Tree Fruit Research Commission

Personal communication – Pete Bristow, WSU Cooperative Extension, Puyallup (raspberries & caneberries)

Personal communication and e-mail – Brian Cieslar, November 17, 2003, Maberry Farms (blueberries)

Personal communication – Glen Dahman, GS Long Dealership, Yakima (tree fruit)

Personal communication – John Dunley, WSU Tree Fruit Research Entomologist, Wenatchee (tree fruit)

Personal communication – Richard Leitz, Fieldman, Wilbur-Ellis Company, Mattawa (apples)

Personal communication – Doug Merriman, Orchardist, Orondo (apples)

Personal communication and e-mail correspondence – Tom Peerbolt, November 17, 2003, Peerbolt Crop Management (blueberries)

Personal communication – Chris Peters, Fieldman, CM Holtzinger Fruit Co., Yakima (tree fruit)

Personal communication – James Ramer, Orchardist/Fieldman, Mattawa (apples)

Personal communication – Edsel Reeves, Orchardist, Baker Flat, East Wenatchee (peaches & nectarines)

Personal communication – Tim Smith, WSU Cooperative Extension, Wenatchee (tree fruit)

Personal communication – Herb Teas, WSCPR Commissioner, Wenatchee (tree fruit)

Personal communication and e-mail correspondence with Tom Waliser, Orchardist (apples)

Personal Communication – James Zahand, CCA, Sales Representative, Dow Agro Sciences (tree fruit)